MODIS Geolocation Status

MODIS Science Team Meeting

January 25, 2001

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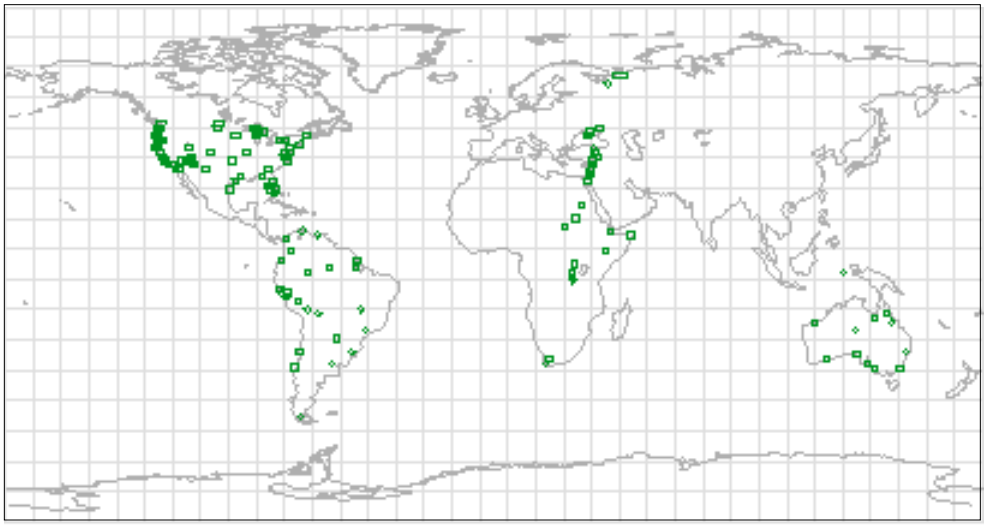
MODIS Geolocation Goals

- Geolocation accuracy specification is 300 m (2 _) and goal is 100 m (2 _) at nadir
- Geolocation goal driven by Land 250 m change product requirements



Global distribution of Ground Control Points

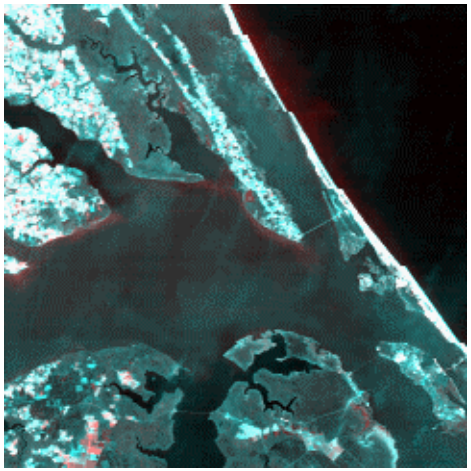
← Land: 550 CPs from 126 TM Scenes

Ocean: 4600 island points from SeaWifs library

Current Status

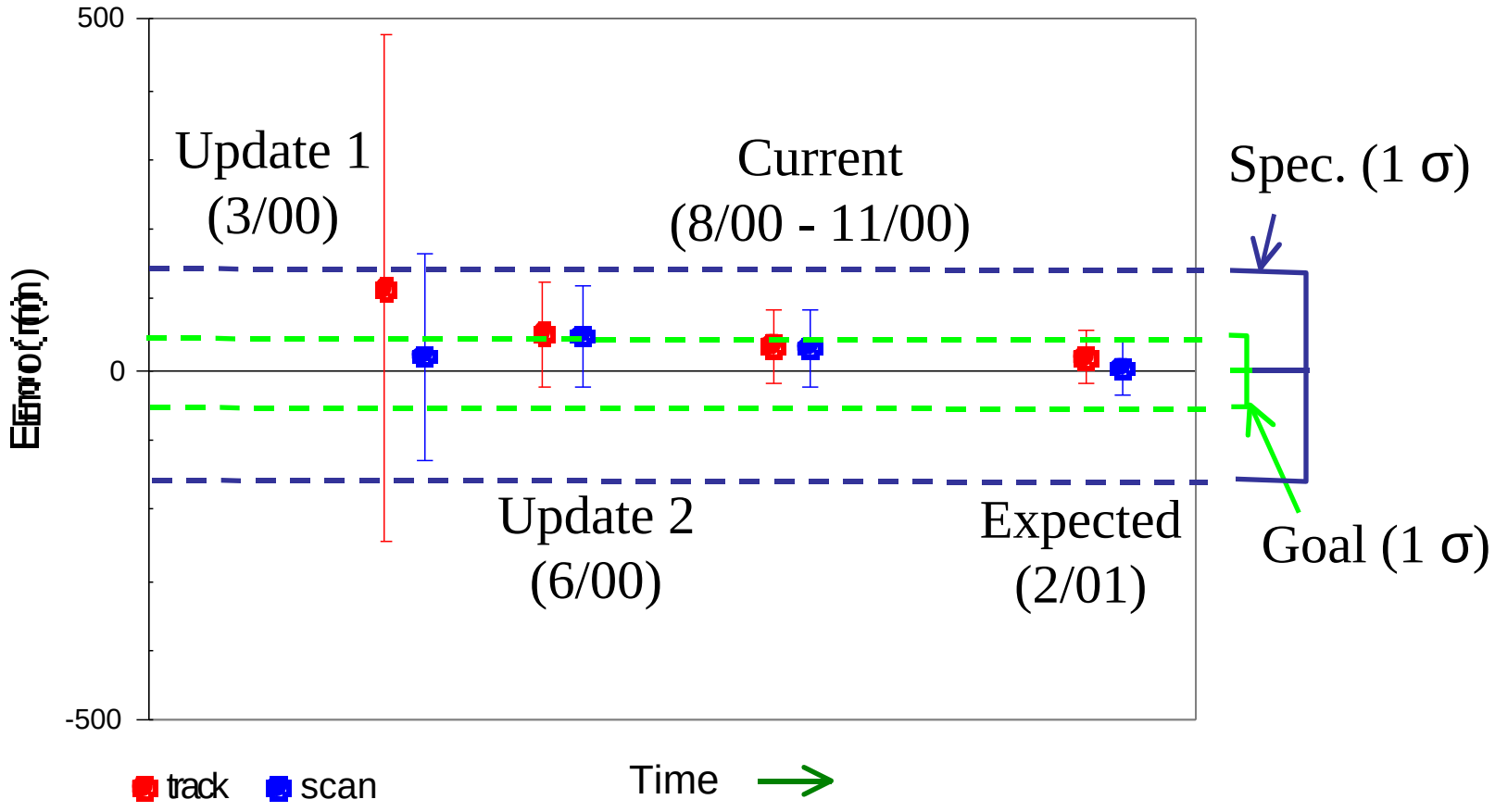
- Initially reduced error to 500 m RMS (March 9, 2000, Data-day 2000/110)
- Correction of yaw (134 arcsec) and mirror wedge/tilt angles (39 arcsec, 270 m at nadir)
  - Reduced error to 100 m RMS (200 m 2 _) (June 26, 2000, Data-day 2000/178)
- Correction of small remaining biases expected in Feb. 2001
  - Roll (12 arcsec, 42 m), Pitch (-7 arcsec, -23 m), Yaw (3 arcsec, 9 m)
  - Scan Mirror Angles:
    Track Wedge (-1 arcsec, 3 m)
    Track Tilt (2 arcsec, 16 m)
    Scan Wedge (-3 arcsec, -18 m)

Current

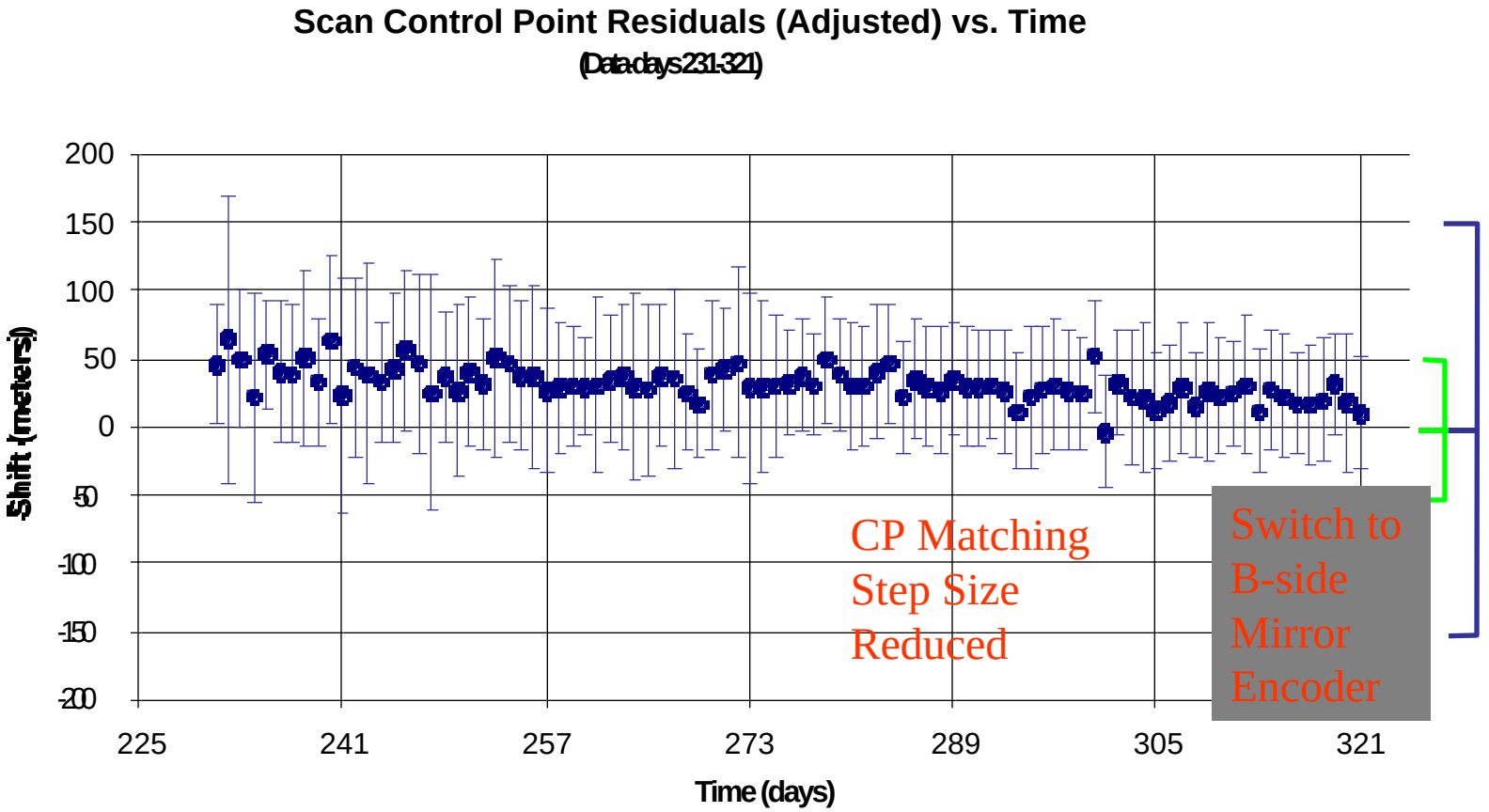


Blue: MODIS
Red: MODIS Simulated from Landsat TM

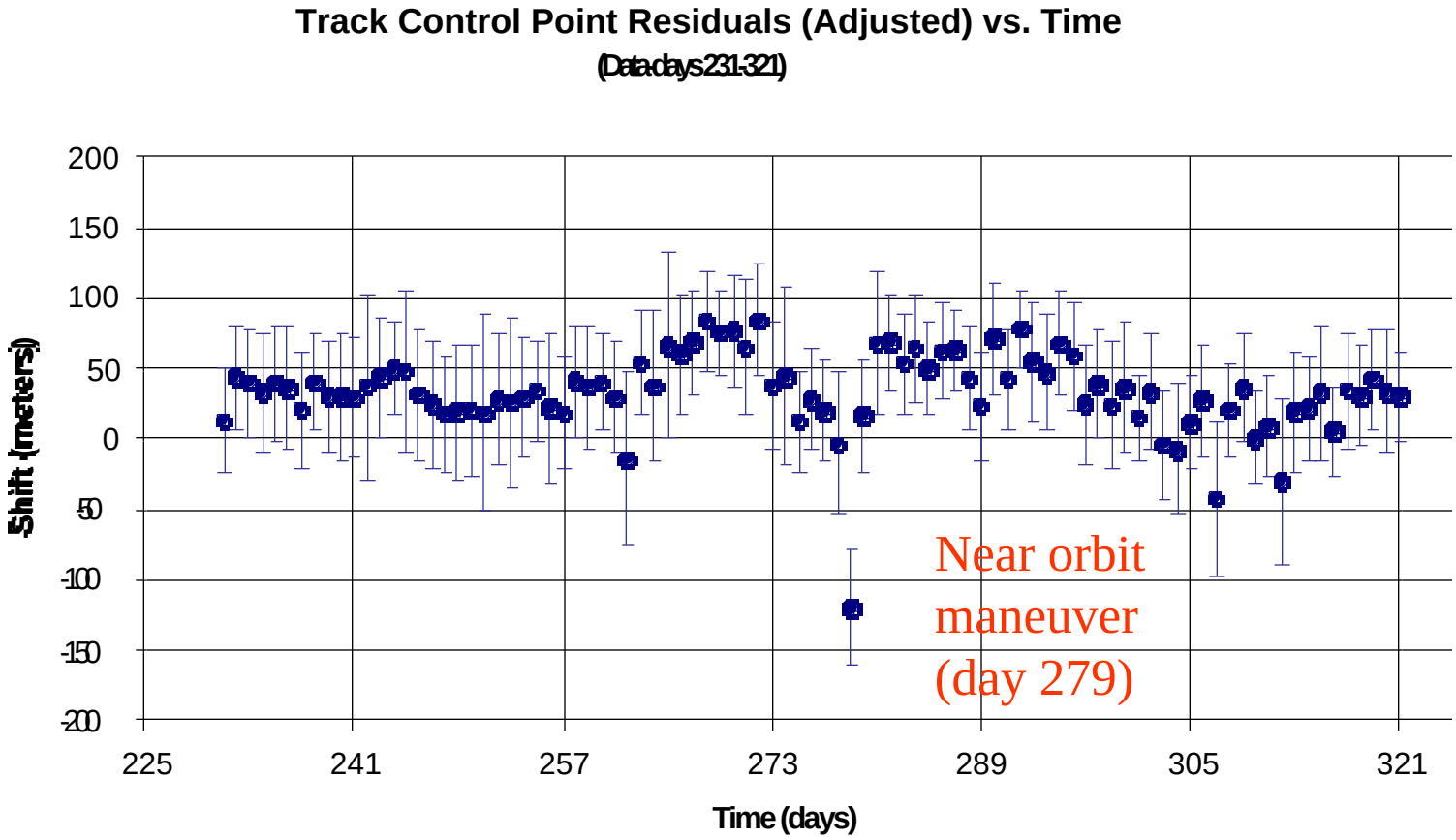
Error Trend


500
0
-500
Update 1
(3/00)
Current
(8/00 - 11/00)
Spec. (1 σ)
Update 2
(6/00)
Expected
(2/01)
Goal (1 σ)
track
scan
Time

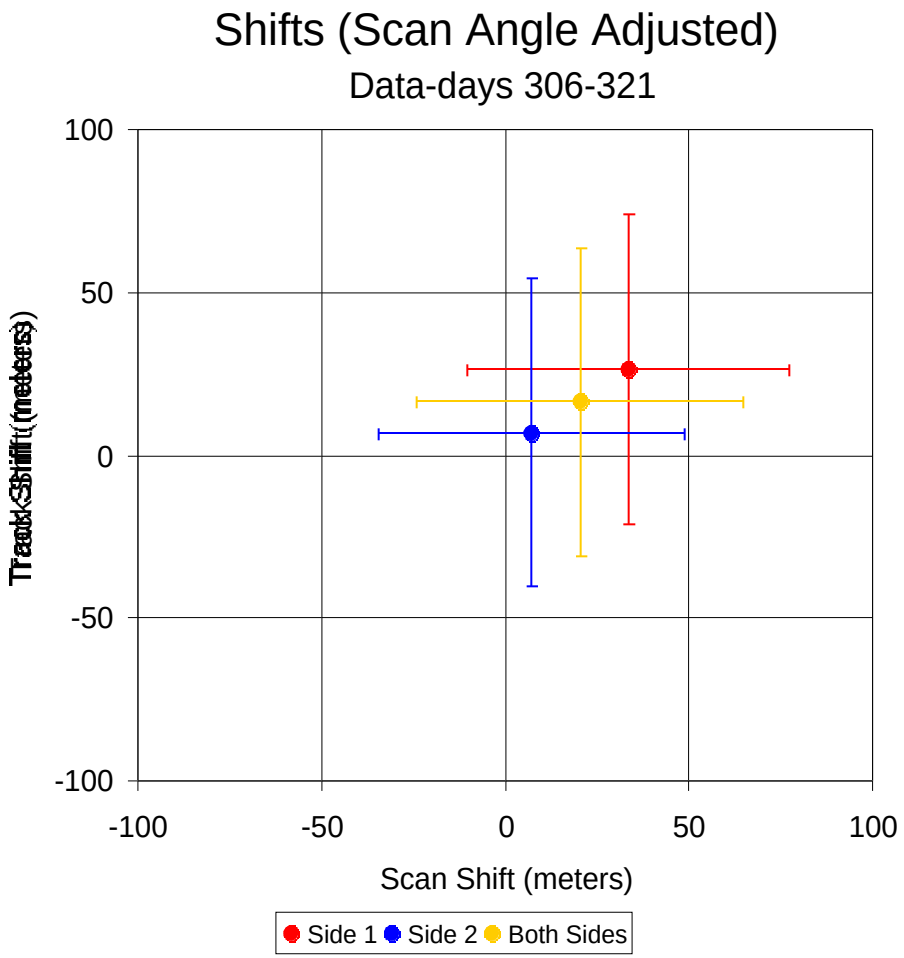
Scan Residuals (231-321)



Track Residuals (231-321)



Mirror Side Differences



Next Steps

- Will look at possible confusion between time and pitch biases
- Longer term analysis will look at trends and cyclical variations
- Examine periods near orbit and attitude maneuvers and other events to determine when instrument is outside of accuracy specifications/goals
  - Develop a process to identify the events
  - Operational island matching needed to provide continuous global measurements – analysis of thresholds and use of cloud mask soon
- Look for dependence on temperature, time on orbit, etc.
- Evaluate terrain model, correction algorithm
- Examine cross-instrument issues – compare results with MISR and ASTER teams

Expect to reach goal by end of February

Terra/Aqua Plans

- Terra code delivery expected in March
  - Automated A/B-side Switch for Reprocessing
  - Other minor improvements
- Aqua at-launch code at DAAC
  - Data driven switch between Terra/Aqua
- Using same error analysis approach for Aqua
  - Some refresh of chip library needed
  - Further work on error analysis